

Newsletter

Week of May 7, 2007

Vol. 8, No. 10



Brian Lott, left; Kristin Cordwell; and Erika DeBenedictis, right, are all smiles after winning the top award in the 17th New Mexico Supercomputing Challenge. Photo by Sandra Valdez, Records Management/Media Services and Operations

From outer space to tiny bacteria Supercomputing Challenge participants use computer models to study problems

by Krista Wilde

“I’ve been interested in science forever, but I first became interested in computer science when my dad gave me an old Pentium I box at the age of ten. I messed that thing up so many times, but I learned so much from playing with it,” says Brian Lott, a home-school student from Albuquerque whose team took the top award at the 17th annual Supercomputing Challenge.

Lott’s love for computer science certainly helped his team, whose project, “Optimization of Trajectories,” involved modeling space flights and using gravitational pull to help spacecraft travel further, faster. The other team members were Erika DeBenedictis, a freshman at St. Pius X High, and Kristin Cordwell, a sophomore at Manzano High School also in Albuquerque.

The team met when Lott, a student intern at Sandia National Laboratories, was approached about working with DeBenedictis. Cordwell and DeBenedictis knew each other, so the three teamed up for the project.

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Researchers begin to unravel the contradictions of urbanization

by Todd Hanson

Humanity has crossed a historic threshold where a majority of people worldwide now live in cities. Yet, even as the debate on how humans impact the natural environment grows, urbanization and its consequences remains poorly understood. For many people, cities are seen as principal sources of social and environmental problems, yet they also are engines of innovation and wealth creation. Recently, Los Alamos scientists studied various features of urbanization in order to better understand their implications for future urban growth.

In research reported in the current issue of the Proceedings of the National Academy of Sciences, the team of researchers from Los Alamos, Santa Fe Institute, Arizona State University, and Germany’s Dresden University of Technology describe their work applying universal scaling laws to the social organization and social dynamics of urbanization. The team analyzed a large number of urban indicators in the United State, China, and several European countries, covering measures of economic productivity, innovation, demographics, crime, public health, infrastructure, and patterns of human behavior. They discovered that all these quantities follow simple statistical scaling relations with population, indicating a continuum of change from small cities to the largest megalopolis.

According to Los Alamos researcher Luis Bettencourt of Mathematical Modeling and Analysis (T-7), “Although people are sometimes quick to point out the blights of large cities, they often

forget their contribution to global economic growth and culture. New York City, for example, is estimated to have an economy larger than that of India, and Tokyo’s is even larger.”

The study revealed that measures of wealth creation and innovation, among other things, increase per capita with city size, in such a way that doubling the size of a city increases its economic productivity per person by about 15 percent.

“What is fascinating and surprising about our results,” Bettencourt said, “is that they show that the good things about cities—such as innovation—and the bad ones—such as crime and the incidence of certain diseases—increase predictably in the same proportion as cities become larger. There is a continuum in these quantities that accelerates dynamics that already are there in the smallest towns, yet become more apparent and conspicuous in the largest cities.”

The authors believe that the results of this study will change the way people think of cities and project their growth. Although many of today’s megacities present some of most daunting problems in terms of poverty and overtaxed infrastructure, these can be overcome via the ingenuity and resources that are already present in these places, as has happened historically in metropolises of now developed countries.

In addition to Bettencourt, other members of the team included Geoffrey West of Elementary Particles and Field Theory (T-8) and the Santa Fe Institute, Jose Lobo from Arizona State University, and Dirk Helbing and Christian Kuehnert from the Dresden University of Technology.


NewsLetter

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Bike safely and enjoy the ride

With warm weather comes an increase in the number of bicycles on the roads. Riding a bicycle can save fuel and provide a great physical workout, but it is vital that bicyclists take safety precautions and adhere to the rules of the road when riding. The following bicycle safety tips are from the National Highway Traffic Safety Administration and the U.S. Consumer Product Safety Commission.

- **Protect the head; wear a helmet.**

Never ride a bicycle without a helmet. The NHTSA and CPSC recommend that riders use bicycle helmets that comply with the CPSC standard. Wearing a helmet can reduce head injuries by 85 percent.

- **Make sure the bicycle is adjusted properly.**

Adjust the bicycle to fit the rider. See the Owner's Manual for guidance.

- **Check brakes before riding; ride slowly in wet weather and apply breaks earlier—more distance is needed to stop on wet surfaces.**

- **See and be seen.**

Wear clothes that are visible—always wear neon, florescent or other bright colors when riding a bicycle.

- **Avoid biking at night.**

Most bicycles are equipped for daylight use and need to be adapted for nighttime riding.

- **Stay alert; always keep a lookout for obstacles.**

Watch for potholes, cracks, expansion joints, railroad tracks, wet leaves, drainage grates, or anything that could cause a fall. Before going around an object or vehicle, scan ahead and behind for a gap in traffic. Plan moves and signal intentions.

- **Go with the flow.**

Ride on the right side in a straight predictable path; always go single file in the same direction as other vehicles.

- **Check for traffic; always be aware of surroundings.**

- **Learn rules of the road; obey traffic laws.**

Bicycles are considered vehicles, and riders must obey the same rules as motorists. Read the New Mexico driver's handbook and learn and follow all the traffic signs, laws, and rules for operating a vehicle on the road.

Welcome!

Last summer, more than 1,200 students from schools around the country came to work at the Laboratory. We again open our doors to students, and I am delighted to welcome those who have chosen to spend their summer working at Los Alamos National Laboratory, one of the world's foremost scientific institutions.

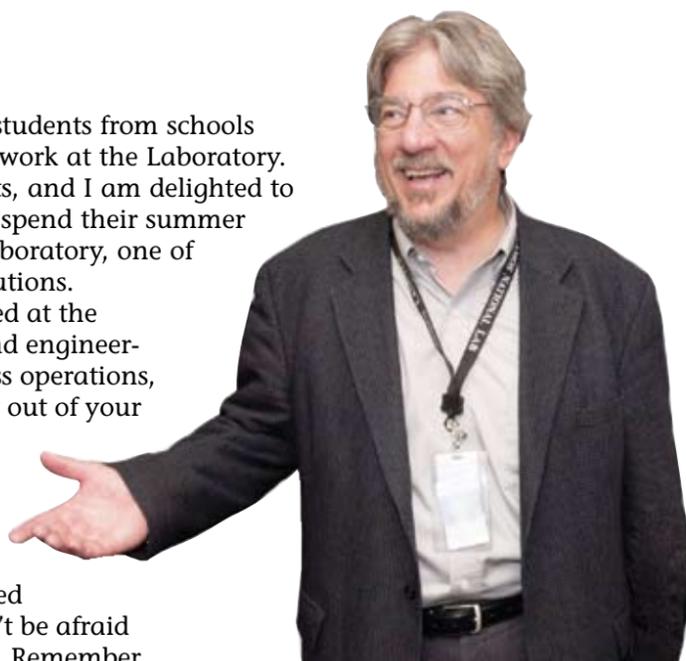
Much can be learned and explored at the Laboratory—from science, math, and engineering to computer technology, business operations, and administration. To get the most out of your time here, be inquisitive and open-minded. Ask questions of your mentor and co-workers, and take advantage of the numerous Laboratory colloquia and presentations. Work hard, follow established procedures and guidelines, and don't be afraid to offer your thoughts and opinions. Remember, learning is a two-way street, and we want your time at the Laboratory to be a positive learning experience for all involved.

During off hours, I urge you to get out and enjoy Northern New Mexico and all it has to offer—this part of the country truly is a land of enchantment, from the magnificent natural surroundings to the diverse art, cultures, and foods.

Most important, whether at work or play, have a safe and secure summer. Please remember that we must all keep our focus by integrating safety into everything we do. If there are conditions in the workplace that compromise your safety, engage your co-workers and managers. Worker commitment and involvement in establishing an improved safety and security culture is a fundamental cornerstone of our success.

We want you to leave the Laboratory enriched by having been here. As I told students last summer, you are important to our nation's future, and it is important to us that you have a rewarding experience. We want you to remember Los Alamos and come back as either students or employees.

Again, on behalf of all Laboratory employees, welcome and have a safe, productive, and memorable summer.



Laboratory Director
Michael Anastasio

New road closure process improves safety, brings cost savings to Lab

by Kathy DeLucas



A placard on the back of this vehicle reminds motorists to stay at least 50 feet behind the convoy in this hazardous materials shipment on East Jemez Road. Photo courtesy of Packaging and Transportation

Drivers along the Pajarito Corridor will see road closures virtually disappear for the movement of hazardous material. A new process will involve using convoys with enhanced safety features to transport hazardous material on roads that once would have required a full road closure.

Under a revised Transportation Safety Document, the Laboratory can now ship most hazardous materials that are non-compliant with Department of Transportation (DOT) regulations onsite without a full road closure. The Laboratory, Los Alamos Site Office, and the DOT have been working together to define "onsite." All organizations agreed that the Pajarito Corridor, protected on both ends by the access portals with security officers that check for badges, meets the DOT requirements for "onsite transportation," mean-

ing the road restricts public access.

"Commensurate access control will be required for transports outside of the existing Pajarito Corridor," said Joseph "Dusty" Lowery, facility operations director for Packaging and Transportation (OS-PT). "However the duration and impact on traffic will be minimal."

Laboratory Packaging and Transportation and Authorization Basis organizations have worked with LASO to virtually eliminate the oftentimes frustrating and time-consuming road closures.

Last year, there were 232 road closures that lasted approximately 30 minutes each. Taking into account operational costs and the estimated cost for people who may be delayed, Laboratory officials say the reduction of road closures could save as much as \$4 million annually.

Because of the Laboratory's important mission, some of the materials that transportation experts haul on a daily basis are not transported in full compliance with the requirements of the DOT. Until now, that meant the roads had to be closed while the items were being moved to establish a commensurate level of safety with DOT. LASO has approved the removal of the full road closure control (for most transports) based on Packaging and Transportation's enhanced safety features and mature program. So, employees will now see a convoy of vehicles moving along with normal traffic flow.

"This is a big deal," Lowery said. "It's all about safety and efficiency."

Full road closures will still be necessary occasionally under certain conditions inside and outside the Pajarito Corridor, however, the frequency of the full road closures will be significantly reduced.

For more information, contact Packaging and Transportation at 5-8628 or go to <http://lanl.gov/orgs/os/pt/> online.

Los Alamos National Laboratory NewsLetter

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Los Alamos National Laboratory is a multidisciplinary research institution engaged in strategic science on behalf of national security. The Laboratory is operated by a team composed of Bechtel National, the University of California, BWX Technologies and Washington Group International for the Department of Energy's National Nuclear Security Administration.

Los Alamos enhances national security by ensuring the safety and reliability of the U.S. nuclear stockpile, developing technologies to reduce threats from weapons of mass destruction, and solving problems related to energy, environment, infrastructure, health and global security concerns.



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New tool aids in understanding Moon's geology

by Nancy Ambrosiano

Using a novel approach to data analysis, a sharper pair of “software glasses,” scientists at the Laboratory are taking a closer look at spectroscopic Moon images to better understand how that body was formed. By perfecting their view of a naturally occurring radioactive element, thorium, Moon researchers can now distinguish details of lunar features that were just “blobs” in the earlier imagery.

“Lunar thorium abundances are a key indicator of various lunar geologic processes. By measuring the global distribution of thorium abundances, we gain insight into how the Moon was formed and how it has changed over time,” said David Lawrence, acting director of the Los Alamos Center for Space Science and Exploration. “In particular, data from NASA’s Lunar Prospector have revolutionized our understanding of the Moon from what were initially thought to be relatively simple global processes to much more asymmetric, complicated processes.”

On July 31, 1999, NASA’s Lunar Prospector spacecraft was deliberately crashed into a permanently shadowed crater near the Moon’s south pole, in the hope that as the grand finale to its mission, it might throw up a dust cloud and reveal water ice. Traces of water were not found, but the various types of data gathered during the full mission still are revealing its intellectual treasure.

The Los Alamos team used an analysis technique called spatial deconvolution to reverse the image, blurring that is, part of the Los Alamos gamma-ray spectrometer data gathered during the mission. This is the first time that global deconvolution analyses have been used on orbital planetary gamma-ray data.

“We find that we have improved the sharpness of the image by a factor of

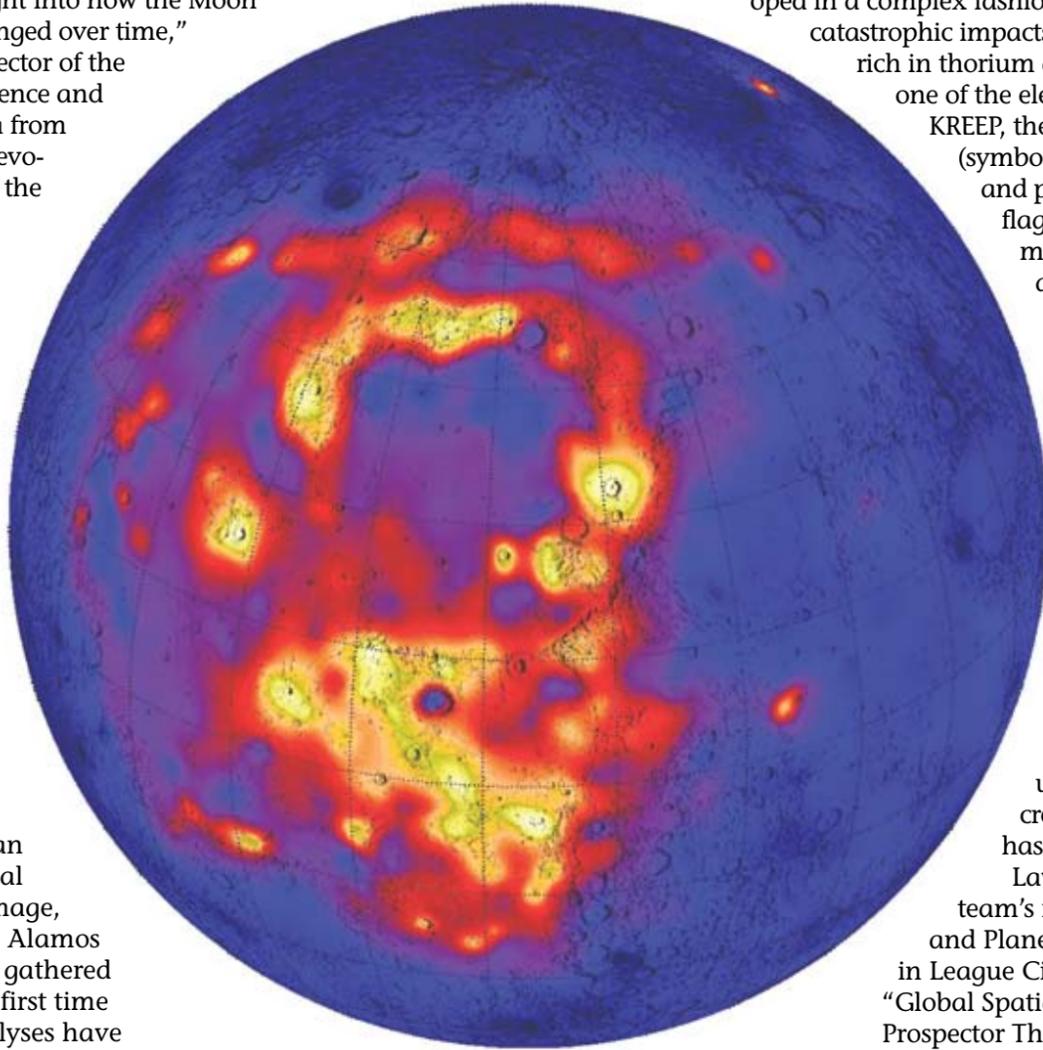
1-1/2 to 2 compared to the original image. With the improved data, we have been able to better understand a number of thorium features on the Moon that were previously too blurry to make out very well, such as the Aristarchus Crater and Plateau,” said Lawrence.

“With the old thorium data, we only saw a single blob covering the whole area. But with the improved analysis we are able to distinguish some mountains from the plateau in the thorium abundances. This information is important in trying to sort out the geology of this complicated region,” he added.

Thorium is interesting to scientists because the Moon developed in a complex fashion, interrupted by frequent catastrophic impacts that spread subsurface rocks rich in thorium across the surface. Thorium is one of the elements in a substance called KREEP, the acronym for potassium (symbol “K”), rare Earth elements and phosphorous, and its presence flags these impacts of geologic melt materials in a measurable fashion. Thorium emits gamma rays—a high-energy form of light—of a distinct energy.

“Because thorium is a tracer for KREEP-rich material, these data provide fundamental information regarding the locations and importance of geologic formations that are rich in KREEP-bearing materials,” Lawrence said. “The location and abundance of these materials provide information that help us to understand processes that created the Moon and how it has changed over time.”

Lawrence recently presented his team’s research at the 38th Lunar and Planetary Science Conference in League City, Texas, in a talk titled “Global Spatial Deconvolution of Lunar Prospector Th Abundances Using the Pixon and Jansson Deconvolution Methods.” The paper also is the subject of the cover of the February 16, 2007, journal *Geophysical Research Letters*, Volume 34, Number 3.



This figure shows thorium abundances for the lunar near-side where dark colors represent low thorium abundances and bright colors represent high thorium abundances. Graphic courtesy of David Lawrence, acting director of the Los Alamos Center for Space Science and Exploration



Lab partners with state institutions for new computing center

by Krista D. Wilde

The Laboratory has partnered with Sandia National Laboratories, New Mexico State University, University of New Mexico, and New Mexico Institute of Mining and Technology to create the New Mexico Computing Applications Center.

Tom Bowles of the principal associate directorate for science, technology, and engineering (PADSTE), and science adviser to the governor, worked with the two laboratories and the three universities to develop a proposal for the 2007 New Mexico State Legislative session. In the proposal was a request for \$42 million over five years to fund the NMCAC. In March, the Legislature approved the first \$14 million, and Governor Bill Richardson signed it into law, said Bill Feiereisen, the Lab’s chief technologist in PADSTE.

The two major goals of the NMCAC are to foster the use of scientific computing for New Mexico business and to support science and technology education. The NMCAC will be composed of three kinds of sites:

- A core institute, located in the Albuquerque area, which will house the computational and computer scientists.
- A computing center, located in the Albuquerque, area that will be run in “lights-out” fashion. “Lights-

out” is a practice in the commercial sector that improves efficiency.

- “Gateway” facilities, located at the founding institutions and several other schools throughout the state, which will house small, local computers and be connected to the main computer center.

“A state supported computing center not only will provide computer resources for research within New Mexico, it also will be a great platform to connect computation and high-tech business. It is an excellent mechanism to support science and technology education and a wonderful opportunity to bring unclassified supercomputing to New Mexico,” said Feiereisen.

The project’s centerpiece will be a supercomputer with a top speed between 100 and 200 Teraflops, a speed that is about 20,000 times faster than a modern desktop computer.

“The hardware is exciting, but the real contribution to the state will be gained from the skills and experience that people acquire while working at this institution, and what they will be able to bring to education and business in the state,” said Feiereisen.

For more information about the NMCAC, contact Feiereisen at 5-6883 or write to wjf@lanl.gov.

Scholarships awarded to local students



Platinum scholar wants to become surgeon

by Krista D. Wilde

Los Alamos High School senior Lawrence Cai is the recipient of the four-year, \$6,000-a-year platinum scholarship from the Los Alamos Employees' Scholarship Fund. The fund is administered through the Los Alamos National Laboratory Foundation.

"I have always been fascinated with the intricacy and fragility of the human body, and I want to help those in need in a practical and precise manner. Being a surgeon would give me an incredible opportunity to offer that help and develop new surgical procedures," Cai said of his future goals.

The three recipients of the four-year, \$3,000-a-year gold scholarships are Mary Bissell of Peñasco High School, Stephanie Catherine Louis of St. Michael's High School in Santa Fe, and Benjamin Mitchell of Taos High School.

The silver scholars, who will receive \$2,000 per year for four years, are Peer Hofstra of Monte del Sol in Santa Fe, Luwen

Huang of Santa Fe High School, Jacob Izraelevitz of Los Alamos High School, Nicholas Mora of St. Michael's High School, Kaitlin Paulson of Los Alamos High School, and Heather Radosevich of Española Valley High School.

The Los Alamos Employees' Scholarship Fund encourages Laboratory employees, retirees, and subcontract personnel to donate to a fund that awards college scholarships to Northern New Mexico students. Scholarships are awarded on the basis of grade point average, test scores, diversity, need, academic rigor, leadership, and community involvement.

Six different types of scholarships are awarded each year, including platinum, gold, silver, bronze, turquoise, and leadership.

To see a list of all the scholarship recipients, go to http://www.lanl.gov/news/newsbulletin/pdf/LAESF_2007_winners.pdf.

The Los Alamos Employees' Scholarship Fund program began in 1998. Since its inception, about 360 scholarships have been awarded, and Laboratory employees have donated more than \$1.5 million to the fund.



Pictured are, top photo, Lawrence Cai, recipient of the four-year, \$6,000-a-year platinum scholarship; and the three recipients of the four-year, \$3,000-a-year gold scholarships, bottom from left to right, Mary Bissell, Stephanie Catherine Louis, and Benjamin Mitchell. Photos courtesy of the Los Alamos National Laboratory Foundation

Employees's scholarship fund campaign in full swing

by Krista D. Wilde

This year's campaign drive for the Los Alamos Employees' Scholarship Fund is different from past years: Los Alamos National Security, LLC, will match employee donations dollar for dollar up to \$250,000 during the campaign, which runs from May 1 to May 31.

Lab employees received brochures and pledge forms at their mail stops last week. Employees can donate by completing the forms in the brochures and returning them to the Laboratory Foundation offices in Española or by visiting the foundation Web page at www.lanlfoundation.org online. Donations also can be made through payroll deduction, credit card, cash, or check.

"A scholarship is more than tuition, it's more than books, it's sitting a young mind

down and saying, 'I believe in you, kid. You got it.' The pride, the gratitude, these are the things that LAESF donors instill in our community's students, and these are the things we all need most," said Jeff Franken of the LANL Foundation, and a former scholarship recipient.

The LANL Foundation is a philanthropic grant-giving entity created in 1997. It

supports a range of regional and community not-for-profit organizations.

For more information about the scholarship fund or the campaign drive, contact Debra Wersonick of Community Programs Office (CPO) at 7-7870 or sonic@lanl.gov or Franken at (505) 753-8890 ext. 15, or write to jfranken@lanlfoundation.org.



The Los Alamos Big Band provides entertainment at the Scholarship Swing kickoff last week outside the National Security Sciences Building. Inset: Nathan Hjem of Monte Carlo Codes dances with Angela Herring of Nuclear Atomic and EOS Data during the kick off event for the Los Alamos Employees' Scholarship Fund. ARAMARK Corp. prepared and sold more than 250 burgers; proceeds go to the scholarship drive, which continues through May 31.

Photos by Mike O'Keefe, Records Management/Media Services and Operations



Enhanced substance abuse policy applies to students

New and returning students should familiarize themselves with Laboratory's policies, including its enhanced substance abuse policy.

The Lab's substance abuse policy applies to all Laboratory employees, including students and includes provisions for

- pre-employment drug testing for all new employees
- random drug testing for all employees (students who have been on casual status are included in this pool of employees)
- drug and/or alcohol testing based on a reasonable suspicion that the policy has been violated
- drug and/or alcohol testing following an incident or accident that results in or has the potential to result in a serious injury.

According to the policy, Personnel Security will notify employees selected for random testing. Workers who are on approved leave from the Laboratory will not be required to appear for a test on that day. A worker who fails to appear for a drug test will be treated in the same manner as if he or she had tested positive for an illegal drug. A positive drug test will result in disciplinary action up to and including termination.

The new policy—IPP 732—is available on the Policy Center Web page and replaces the previous substance abuse policy (AM110).

For more information about the policy, contact Employee Relations at 7-8730.

Students' Association Web site <http://sa.lanl.gov>

The Students' Association is a group "By students, for students" that hosts social events for students, such as the annual mentor and student picnic each summer, movie nights, and sporting events.

All student employees at the Laboratory are members of this group and are encouraged to attend events sponsored by the Students' Association.

Go to the Students' Association Web site at <http://sa.lanl.gov> for information about housing, important contacts, calendar of events, professional development, and more.

Want to hire a Co-op student?

Contact
Brenda Montoya
at 7-4866

Student calendar of events, summer 2007

This schedule is subject to change. For updates go to <http://sa.lanl.gov/calendar.php> online.

May

- May 14, New Student Orientation, 8 a.m., Canyon Complex (offered every Monday and Wednesday from May 14 to June 20 with the exception of Memorial Day)
- May 23, Wellness Center tour with continental breakfast, 8:30 a.m. (limited to 30 students—registration required)
- May 28, Laboratory closed for Memorial Day
- May 29, Nominations for Students' Association (SA) officers begins

June

- June 8, Los Alamos Neutron Science Center (LANSCE) Tour, time TBD
- June 12, Trinity Beverage Company—Students' Association question-and-answer time for interested SA officer applicants
- June 20, Wellness Center tour with continental breakfast, 8:30 a.m. (limited to 30 students—registration required)
- June 21, Winning résumé workshop for undergrads, 9-11:30 a.m., Canyon Complex, Room 165
- June 21, All-student meeting with director, 2 p.m., Duane Smith Auditorium, Los Alamos High School

July

- July 4, Laboratory closed for Independence Day
- July 9, Call for Distinguished Student and Mentor Awards
- July 12, All-students picnic, Urban Park
- July 17-19, Students' Association officer elections
- July 18, Los Alamos Women in Science luncheon, 11 a.m., Canyon Complex, Room 160
- July 20, LANSCE Tour, time TBD
- July 24, Curriculum Vitae workshop for graduate students, 9-11:30 a.m., Canyon Complex, Room 165

August

- Aug. 1 and 2, annual Student Symposium, University of New Mexico, Los Alamos



Important numbers and Web sites

- Education and Postdoc Office: 7-4866
- 4myhr: 4-6947, new hires, salary issues, questions
- Benefits and Employment Services: 7-1806
- Institutional Training Services (CT-ITS): Training for students, 5-8644
- Badge Office: 7-6901
- Bradbury Science Museum: 7-4444
- Townsite—LA Bus Routes: www.labus.org
- LANL Taxi: 7-TAXI (7-8294)
- Park and Ride commuter bus service: 1-866-551-7433

Lab program helped student follow his passion

Electromechanical Technician Training Program teaches students about electronics

As a child, Joel Joseph of Applied Electromagnetics (IAT-2) tried unsuccessfully to fix a broken television, but over the years, he successfully worked on car stereos and high-output radio wiring.

When Joseph was making a career choice, he found an opportunity to train in a field that interested him and earn an income at the same time when he entered the Laboratory's Electromechanical Technician Training Program (EMTP). Joseph is one of four recent graduates of the program, and he has since joined the Laboratory as a technician in IAT-2. His work includes building and testing electronic equipment and some mechanical assembly.

EMTP is a two-year work study program designed to train students in electronics, drafting and basic engineering principles. The program was started at the Los Alamos Neutron Science Center (LANSCE) a few years ago but has expanded to include the entire Laboratory. Lab technical staff members mentor student participants, and upon successful completion of the program, students are awarded a certificate in electromechanical technology. Continued employment at the Lab is a possibility, dependent on the availability of a position, funding, and positive evaluations, said Brenda Montoya of the Education and Postdoc Office (STBPO-EPDO).

Joseph's mentor, Michael Weber says the program is a great way to get fresh talent into the Lab. "It's very effective because I can see how the student will fit into the Laboratory setting before he or she is actually hired," he said.

The Education and Postdoc Office is recruiting mentors and sponsors for this training program. For more information about the program, contact Montoya at 7-4866 or write to bmontoya@lanl.gov by e-mail.

<http://int.lanl.gov/news/links/>

LINKS
DAILY BRIEFS & INFORMATION



So...what do you think?

Q: Last month, the Laboratory hosted a national conference on education that examined, among other things, the state of science education in our nation's schools. What can the Laboratory do to help create more interest in science, engineering, and math among the nation's youth and to pave the way for future generations of Laboratory researchers?



Mat Briggs of Hydrodynamics Experiments (HX-3)

Support staff outreach (travel, supplies) and publicize availability of support.



Pam Torres of HR Systems (HR-SYS)

Start young. We need to get into schools at a secondary level. Demonstrate the exciting part of science. Gear towards the issues that concern today's youth.



Orlanda Ortiz-Roybal of Weapons Budgeting (CFO-3)

The Laboratory can go to the schools in the area and have speakers in the fields of science and engineering give presentations and talks to the students via school assemblies.



Jerry Paulson of Operations (PADOPS)

The Laboratory needs to help with our country's focus on the importance of education with an emphasis on science. The summer student program at the Lab is outstanding, and its approach needs to be expanded in our country.



Hashem Mourad of Fluid Dynamics (T-3)

Invite science and engineering students to work at the Lab over the summer and maybe hold competitions of some sort among students.



Ann Marie Gonzales of Treasury, Pension, and Tax (CFO-TPT)

The Laboratory is doing a great job at implementing science education in Northern New Mexico by involving young children. I think there should be more exposure on a greater level."

PEOPLE



Farrar named Fellow of the American Society of Mechanical Engineers



Chuck Farrar

Chuck Farrar, director of the Laboratory's Engineering Institute, has been named a Fellow of the American Society of Mechanical Engineers, a prestigious distinction recognizing his numerous career contributions to the engineering field.

Farrar is internationally recognized for his sustained and outstanding scientific achievements in structural health monitoring and damage prognosis, making him something of a pioneer in SHM. His work has involved proposing new concepts in statistical pattern recognition paradigms for SHM, recognizing environmental variability in SHM applications, and developing integrated hardware and software solutions for SHM problems. The results of this research have resulted in more than 250 refereed journal articles, book chapters, conference papers, and laboratory reports. In addition, Farrar has been invited to give numerous keynote lectures at international conferences and has served on several journal editorial boards.

Farrar also has been very active in various educational efforts focused on structural dynamics. In 2000, he founded and has managed the Los Alamos Dynamics Summer School, an eight-week program that trains undergraduate and graduate students in aspects of structural dynamics. Farrar also founded the Los Alamos/University of California, San Diego, Engineering Institute, which offers formal graduate programs in the area of damage prognosis and validated simulations in engineering mechanics.

Farrar has worked at the Laboratory for

more than 23 years, serving as a technical staff member, project leader, and team leader.

ASME is member organization of the American Society of Mechanical Engineers International. Fewer than 2 percent of ASME's 130,000 members are named Fellows.

Brown receives Young Leader Professional Development Award



Eric Brown

Eric Brown received the Minerals, Metals, and Materials Society's 2007 Young Leader Professional Development Award for the Structural Materials Division.

As one of 10 recipients of the award selected from each of the society's five technical divisions, Brown will

attend Minerals, Metals, and Materials Society conferences, learn more about activities and opportunities within the society, and engage with prominent society members and leaders.

Brown of Structure and Property Relations (MST-8) received his doctoral degree in theoretical and applied mechanics from the University of Illinois at Urbana-Champaign. He came to Los Alamos in 2003 as a Director's Funded Postdoctoral Fellow in MST-7/8 and became a technical staff member in 2005.

Brown received a Director's Achievement Award and a National Science Foundation Fellowship for the U.S.-South America Workshop on Mechanics and Advanced Materials Research and Education.

Brown received the award at the society's annual meeting and exhibition in Orlando, Florida.

In Memoriam

Alex Louis Marusak

Laboratory retiree Alex Louis Marusak died February 6. He was 65.

Marusak joined the Laboratory in 1969 as a staff member in the Theoretical (T) Division. He left the Lab in 1971 and returned in 1975 working in the former (Geosciences (G) Division. Marusak retired in 1998 while working in the former Nonproliferation and International Security (NIS) Division.

Marusak received a doctorate in nuclear physics through the University of Texas.

James Hudgins

Laboratory retiree James Hudgins died March 16. He was 79.

Hudgins joined the Laboratory in 1951 as a photostat operator in the former Graphic Arts (GA).

When he retired in 1986, Hudgins was a deputy group leader in the former Information Services (IS) Division.

He is survived by his wife, Lois; son David Hudgins; daughter Sherilynn Ryan; brothers Bill Hudgins and Robert Hudson; and seven grandchildren.

Frederick Rollins Parker

Laboratory retiree Frederick Rollins Parker died March 28. He was 77.

Parker began working at the Laboratory in 1957 as a staff member in the former GMX Division. At the time of his retirement in 1991 he was working in the former Nuclear Technology and Engineering (N) Division.

Parker received a bachelor's degree in math from New Mexico School of Mines and a master's degree in math at the University of Wisconsin. He served in the military during World War II.

Parker is survived by his wife, Margery; sons Ronald of Los Alamos and Zackery of Little, Colorado; daughter D'Neale Haddenhorst of Billings, Montana; brother Joe; and sisters Betty Smith and Frances Feloshtway.

Supercomputing ...

continued from Page 1

"Teamwork was an important part of our success. We are from three different schools, so we really had to work together," said Lott.

Beverly DeBenedictis agreed that teamwork was important for her daughter's team. "They were a wonderful team because they all have strengths in different areas. They learned how to work together through this process."

Iliana and Stoyana Alexandrova, sisters from Los Alamos High School, took second place at the Supercomputing Challenge with their project, "E. coli in Hostile Environments."

They used supercomputers at Los Alamos to model how bacteria evolves or is affected when subjected to hostile environments. Their research suggests that bacteria does in fact evolve and develop different characteristics when exposed to extreme environments. The sisters suggest that if E.coli bacteria's usual characteristics can be changed, it may be useful for treating cancer.

"I am most excited about the memory effect [on the bacterial], because it shows micro-organisms can be modified. This could make a huge impact on medicine and the way people are cured," said Stoyana Alexandrova.

The team hopes to perform the experiment they modeled in order to check their data.

Dov Shlachter and Jonathan Robey of Los Alamos High School earned third place for their project, "A Lot of Hot Air: Modeling Compressible Fluid Dynamics."

Their project aimed to create a two-dimensional model to predict the behavior of an ideal compressible fluid.

The fourth place team was composed of Alex Clement, Amy Clement, Greg Fenchel, Jeff Fenchel, and Jayson Lynch of Sandia Preparatory School. Their project, "Examining the Evolution of Social Behaviors," modeled the evolution of ethnocentrism in given geographical locations. This team also earned a Teamwork Award from the Council for Higher Education Computing Services Inc. and the Albuquerque Tribune Lighthouse Award for the Most Professional Presentation.

The Supercomputing Challenge, sponsored by the Laboratory and the state of New Mexico, is open to New Mexico high-school and middle-school students. Participants spend an academic year developing computer programs and learning about computer science with mentors from the state's national laboratories and other organizations.

The goal of the event is to increase knowledge of science and computing; expose students and teachers to computers and

applied mathematics; and instill enthusiasm for science in the students, their families, and communities.

This year, participants received \$95,000 in individual scholarships. Of this amount, the Laboratory's Computing and Computational Sciences (CCS) Division supplied \$80,000. Thirty-one participants received scholarships of at least \$1,500.

Other Supercomputing Challenge awards included

- Creativity and Innovation Award from Sandia National Laboratories to Eric Benner, Steven Benner, Samuel Bonin, and Anthony Rodriguez of Manzano High
- Internet Research Award from the Council for Higher Education Computing Services Inc. to Calvin Loncaric, Kirat Pandya, Coleson Ruminer, Paolo Venneri, and Gabe Vigil of Los Alamos High School
- Community Focus Award to Raquel Descheenie and Lane Thomas of Navajo Preparatory School
- Best Technical Award to Kyle Jacobs, Richard Rush, and Kayla Thompson of Melrose High School
- Student's Choice Award to Kyle Jacobs, Richard Rush, and Kayla Thompson of Melrose High School
- Los Alamos National Laboratory Environmental Award to Chris Hughes and Ruben Hamming-Green of the Academy for Technology and the Classics
- New Mexico Network for Women in Science and Engineering Award to Alessandra Anderson, Kaitlyn Hughes, Vivek Prinja, and Matthew Scharmer of Sandia Preparatory School
- High Performance Award from Cray Inc. to Punit Shah and Jack Ingalls of Albuquerque Academy
- BX Internet Best HTML Award to Punit Shah and Jack Ingalls of Albuquerque Academy
- MathWorks Rising Star Award to Michael Wang of Albuquerque Academy
- Computer Forensics and Encryption Award to Craig Mayberry and Ashley Durham of Artesia High School
- Overcoming Adversity Award to Ryan O'Rourke, Marty Cabeen, Aundre Huynh, and Kevin Kortkamp of Jackson Middle School
- Middle School Awards to Calin Popa, Reed Sanchez, and Jeremy Adkins of Bosque School and Jarett Jones and Luis Maura of Rio Rancho Mid-High
- Best StarLogo Award from Santa Fe Institute and MIT to Calin Popa, Reed Sanchez, and Jeremy Adkins of Bosque School
- New Logo Winners to Jorge Palma, Carlos Suarez II, Nathan Smith, Abraham Sanogo, and Jeffrey Wang of Las Cruces High School.



Marquita Romero

Former challenge winner gives back

"I decided to volunteer at this year's Supercomputing Challenge, because I like to give back and I wanted to help students in the same way volunteers helped me when I was part of the program," said Marquita Romero of the Office of the Chief Information Officer (IST-OCIO).

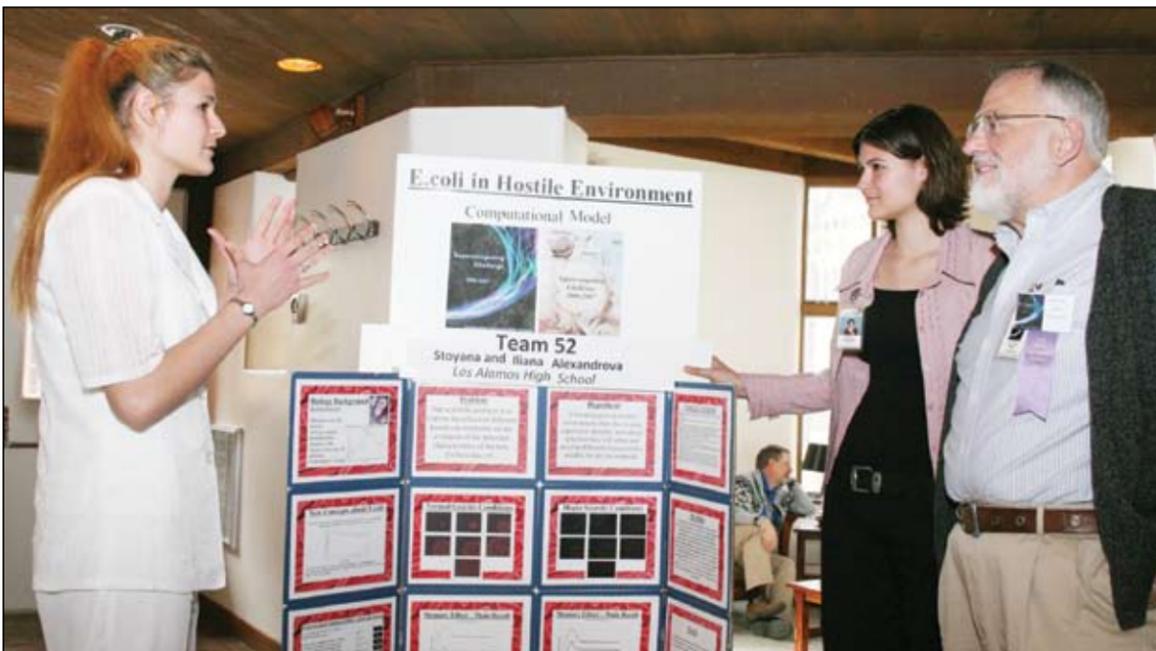
In 1998, during her junior year at Española Valley High School, Romero and three other students participated in the Supercomputing Challenge. Their teacher was Tom Lopez. The team received the Environmental Modeling Award for their study of methane clathrates, and whether one of its components could be used to create alternative energy.

"It was great exposure to the scientists at the Lab," explained Romero. I was able to gain experience with giving presentations and computer programming. It was a very well-rounded experience."

The computer programming experience sparked Romero's interest, and she earned a master's degree in business administration with a concentration in management information systems from New Mexico Highlands University in December 2005.

Romero began working as a high school co-op student at the Lab in 1998. In August 2006, she became a graduate research student and recently was converted to a limited-term staff member. She works on the Enterprise Architecture PRIDE (Product Realization Integrated Digital Enterprise) Initiative, helps maintain the Information Architecture Web site out of the Office of the Chief Information Officer, and helps create institutional information technology standards and guidelines.

"I think it is a good thing to help with, because I was involved in the program during high school and had a very positive experience," Romero said of the Supercomputing Challenge.



Iliana Alexandrova, left, and her sister, Stoyana Alexandrova, talk with Cleve Moler, co-founder of MathWorks Inc., about their research project during the judging portion of the Supercomputing Challenge at University House. Their project won second place in the competition. Photo by Sandra Valdez, Records Management/Media Services and Operations



Giving hope to those in need

Lab employee aids Police, Fire departments

by Krista D. Wilde

Last June, Jeff Eichorst of Performance Measurements (CAO-PFM), an ordained pastor, heard that the local police chief was reaching out to the faith community to help address needs in the area. Eichorst and his wife, Bonita of the Los Alamos Site Office, who also is an ordained pastor, heeded the call and volunteered to help.

“My wife and I know there are hurting people in the community, and we want to be there for them. Our hearts are with the community, so we wanted to see what we could do to help,” said Eichorst. After meeting with the police chief, Eichorst started a chaplain program, the Jemez Community Chaplain Corps. The program, a charter of the International Fellowship of Chaplains, provides chaplain services for the Los Alamos Police and Fire departments.

Eichorst and seven others serve as chaplains in the Jemez Community Chaplain Corps and are being trained in a variety of areas, such as basic chaplaincy, stress-management counseling, Post-traumatic Stress Disorder, and listening skills. They provide pastoral counseling to police officers, firefighters, other department personnel, and their

families, as well as to members of the community who are struggling with grief, trauma, or other life issues. “Chaplaincy is not inherently religious—in fact, per the Supreme Court, it is secular,” said Eichorst. “We just want to help people get through trials regardless of their religious beliefs.”

Eichorst wrote the policies for the new program, capturing the needs of the police and fire departments. Together with the other chaplains, he is building relationships with the department staffs.

“Police officers and firefighters are unique. Most people run away from fires and dangerous situations, but they run to these events. Consequently, their lives are more impacted by tragedy. The rest of us are touched by tragedy, but they deal with it everyday, and they have to cope with a type of stress that most of us can’t fathom,” said Eichorst.

Although the chaplains are faced with many difficult situations, their work does have a lighter side. “The chaplains who are ordained can perform marriage ceremonies for officers and firefighters. In fact, I will officiate a ceremony [this month],” said Eichorst.

Eichorst’s passion for volunteer work is fueled by his faith. “Five years ago, I heard a man from New Zealand give a message about giving



Jeff Eichorst

to others and how his church bought smoke detectors for everyone in his town. That message stuck with me, and that’s what I believe the Church is supposed to be about—helping the community, not just those who come to your church. We are supposed to help those who are in trouble, and that really resonates with me.”

Although the program is in its early stages, Eichorst already is planning for the future. He envisions a day when the program focuses not only on first-responders but also on people in hospice programs, hospitals, and jails, as well as those recovering from disasters like Hurricane Katrina or Virginia Tech.

“I volunteer because I enjoy seeing people come out of a traumatic situation. I like to know that I was there when someone needed help; and that I had a positive impact on how they walked through their trials.”



Jeff Eichorst, center, and his wife, Bonita, talk to Keith Henry of the Los Alamos Fire Department after a recent fire department graduation ceremony. Eichorst of Performance Measurements and his wife provide pastoral counseling to police officers, firefighters, other department personnel, and their families. Photos by Michael O’Keefe, Records Management, Media Services and Operations